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ATTORNEY DOCKET NO. 10030914-01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Annette C. Grot, et al.

Serial No.: 10/698210

Examiner: Jayme L. Browne

Filing Date: October 31, 2003

Group Art Unit: 1733

Title: Method For Selective Area Stamping Of Optical Elements On A Substrate

COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on January 11, 2006.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

(a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)(1)-(5)) for the total number of months checked below:

- |                          |              |           |
|--------------------------|--------------|-----------|
| <input type="checkbox"/> | one month    | \$ 120.00 |
| <input type="checkbox"/> | two months   | \$ 450.00 |
| <input type="checkbox"/> | three months | \$1020.00 |
| <input type="checkbox"/> | four months  | \$1590.00 |

The extension fee has already been filled in this application.

(b) Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 50-1078 the sum of \$500.00. At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account 50-1078 pursuant to 37 CFR 1.25.

A duplicate copy of this transmittal letter is enclosed.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date of Deposit: March 10, 2006

I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below.

Date of Facsimile:

Typed Name: Linda A. Iimura

Signature: Linda A. Iimura

Respectfully submitted,

Annette C. Grot, et al.

By

Juergen Krause-Polstorff  
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Reg. No. 41,127

Date: March 10, 2006

Telephone No. 650 485-5904



USSN 10/698,210

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PATENT

Attorney Docket No. 10030914-1

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant: Nystrom et al.

Group Art Unit: 1733

Serial No. 10/698,210

Examiner: Jayme L Browne

Filed: October 31, 2003

For: METHOD FOR SELECTIVE AREA STAMPING OF OPTICAL ELEMENTS ON  
A SUBSTRATE

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

BRIEF ON APPEAL

Sir:

This brief is in furtherance of Applicants' Notice of Appeal filed January 11, 2006 appealing the decision of the Examiner dated December 22, 2005 finally rejecting claims 1 – 20. A copy of the claims appears in the Appendix to this brief. This brief is transmitted in triplicate.

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CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.8

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as U.S. First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

Date: March 10, 2006

Signed: Linda A. Iimura

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Linda A. Iimura

REAL PARTY IN INTEREST

The real party in interest in this appeal is: Agilent Technologies, Inc.

RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal, there are no such appeals or interferences.

STATUS OF THE CLAIMS

A. Total number of Claims in Application

Claims in the Application are: 1-22

B. STATUS OF ALL CLAIMS IN APPLICATION

1. Claims canceled: 21-22
2. Claims withdrawn from consideration but not canceled: NONE
3. Claims pending: 1-20
4. Claims allowed: NONE
5. Claims rejected: 1-20

C. CLAIMS ON APPEAL

The Claims on Appeal are: 1-20.

## STATUS OF AMENDMENTS

A Response to the Final Office Action was filed on December 12, 2005; however, no amendments were made to the Claims and Claims 21-22 were cancelled. An Advisory Action before Filing of an Appeal Brief was issued January 23, 2006. Therefore, the Claims on appeal herein are Claims 1-20 as finally rejected in the Final Office Action dated December 22, 2005.

## SUMMARY OF CLAIMED SUBJECT MATTER

The claimed invention is directed to a method for selective area stamping of optical elements on a substrate. Multiple micro-optic components on one or two sides of a substrate may be fabricated using a batch process. The substrate may then be diced into individual lens assemblies. In selective area stamping, the optically curable polymer is not contiguous over the substrate which decreases breakage during singulation. This is achieved by having a gap whose dimensions are determined by the separation distance  $d$  between the substrate and molds. The separation distance  $d$  sets the approximate height and area dimensions needed for the gap size so that the size of the gap is sufficient to allow the optically curable polymer to move vertically up the sides of the gap as the substrate and molds are brought together, reducing the thickness of the film formed on the substrate.

A method for making molded optical elements on selected areas on a surface of a substrate in accordance with the invention is described starting on page 3, line 1 of the specification, shown in FIGs. 1a-e. The method as recited in Claim 1 of making molded optical elements (190) on selected area on a surface of a substrate (120) comprises providing a first (110) and a second stamper (110) each comprising a mold (145), the first (110) and the second stamper (110) being separated by a gap (191), coating the molds (145) with a locally dispensed optically curable polymer (115), bringing the selected area on the surface of the substrate (120) into contact with the coated molds (145), exposing the surface of the substrate (120) in contact with the coated molds (145) to light and

separating the substrate (120) from the molds (145) to leave the molded optical elements (190) on said selected areas on the surface of the substrate (120).

## GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-2, 5-6, 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0,911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0,911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613), as applied to Claims 1, 2, 5-6, 8 and 11, and further in view of Kondo (U.S. Patent No. 6,653,157).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0,911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613), as applied to Claims 1, 2, 5-6, 8 and 11, and further in view of Nishikawa et al. (U.S. Patent No. 6,730,459).

Claims 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0,911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613), as applied to Claims 1, 2, 5-6, 8 and 11, and further in view of Morita (U.S. Patent No. 6,814,897).

Claims 9-10, 13-14 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0,911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613) and further in view of Morita (U.S. Patent No. 6,814,897), as applied to Claims 1, 2, 5-7 and 11-12 and further in view of Harden et al. (U.S. Patent No. 6,610,166).

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over over Hamanaka et al. (EP 0,911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613) and further in view of Morita (U.S. Patent No. 6,814,897), as applied to Claims 1, 2, 5-7 and 11-12, and further in view of Uehara (U.S. Patent No. 4,566,930) and Takakuwa et al. (U.S. Patent No. 6,280,660).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over over Hamanaka et al. (EP 0,911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613) and further in view of Morita (U.S. Patent No. 6,814,897), as applied to Claims 1, 2, 5-7 and 11-12 and further in view of Fujita (U.S. Patent Application 2004/0090571).

Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over over Hamanaka et al. (EP 0,911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613) and further in view of Morita (U.S. Patent No. 6,814,897), as applied to Claims 1, 2, 5-7 and 11-12 and further in view of Houlihan et al. (U.S. Patent No. 6,700,708).

## ARGUMENT

## GROUNDS OF REJECTION (Claims 1-2, 5-6, 8 and 11)

The Examiner has finally rejected Claims 1-2, 5-6, 8 and 11 under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0,911,144) in view of Galarneau et al. (U.S. 5,597,613).

Regarding Claim 1 the Examiner states in part:

The rejection of Claim 1 ...acknowledges that Hamanaka et al. is silent toward having gaps and explains why it would be obvious to include gaps. Hamanaka et al. is silent toward providing a first and second stamper each comprising of [sic] a mold and being separated by a gap. One skilled in the art would have readily appreciated that the microlens arrays from the teachings of Hamanaka et al. could be made using multiple stampers that are separated by gaps. The resin would be applied to the stampers, a large glass substrate would be placed on the resin in the stamper molds, and then the substrate would be diced. It is well known to use multiple stampers as shown for example by Galarneau et al. who teaches using quartz master elements (stampers) for tiling a large diffractive optical element (Column 1, line 49- Column 2, line 35; Column 5, line 45 - Column 6, line 12). The gaps (dicing areas) from the single stamper with the plurality of concave portions would correspond to the gaps that would separate the multiple stampers. One skilled in the art would have readily recognized that the two are alternate expedients which are obvious over one another in the absence of unexpected results and results in the same end product (microlens arrays). It is noted that the specification describes no criticality for having multiple stampers rather than one large stamper with multiple stamping regions separated from one another as shown for example in Figure 5 of Hamanaka et al. Also, one skilled in the art would have readily appreciated that using multiple stampers reduces manufacturing costs and provides additional weight reduction (Galarneau et al.: Column 1, lines 49-56). It would have been obvious to one of ordinary skill in the art at the time of invention was made to use multiple stampers that have molds in the method of Hamanaka et al. as suggested by Galarneau et al.

The Examiner is incorrect in stating that the specification describes no criticality for having multiple stampers rather than one large stamper with multiple stamping regions separated from each other as shown in Figure 5 of Hamanaka et al. Figure 5 of

Hamanaka et al. shows multiple substrates 6. An object of selective area stamping is to allow various optical elements to be combined on a single substrate as noted in the “Brief Summary of the Invention” see page 1, lines 24-25, in the Application as originally filed.

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination and is not sufficient to establish *prima facie* obviousness. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). The instant invention deals with making “multiple micro-optic components on one or two sides of a substrate” (see Specification as originally filed, page 1, lines 15-16) using multiple stampers in parallel separated by gaps. The Examiner admits that Hamanaka et al. is silent toward having “gaps” as recited in Claim 1 but maintains that Galarneau et al. teaches multiple stampers and that one skilled in the art would be motivated to combine Hamanaka et al. with Galarneau et al. However, the argument by the Examiner that Galarneau et al. recites a reduction in manufacturing costs and an additional weight reduction of larger optical elements as an advantage in using the method of “tiling” small master elements using a step and repeat technique (not multiple stampers in parallel) (see col. 2, lines 13-14) to make a larger optical element (e.g. see Abstract) does not provide a motivation to combine as Galarneau et al. teaches the undesirability of having gaps (see below) and hence teaches against the combination. Additionally, Galarneau et al. teaches the use of SURPHEX, a dry photopolymer in sheet form, (col. 2, lines 36-38) and states that “existing liquid photopolymers ... are not optimized for step-and-repeat applications due to their ‘messy’

state as the excess material flows into neighboring regions” (col. 3, lines 63-66) in distinction to Hamanaka et al. which deals with a liquid photopolymer and also the instant invention which deals with the use of a “locally dispensed optically curable polymer” (emphasis added, see Claim 1). Therefore, Galarneau et al. lack a motivation to combine. Hence, the Examiner has failed to make a *prima facie* case of obviousness because Galarneau et al. do not provide any motivation to combine and Claim 1 is allowable.

It is improper to combine references where the reference teaches away from their combination. *In re Grasseli*, 713 F2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). Galarneau et al. does not deal with “making molded optical elements on selected areas on a surface of a substrate” as recited in the preamble to Claim 1 using multiple stampers 110. The use of multiple stampers 110 separated by gaps 191 in accordance with the invention allows, for example, easy singulation because the optically curable polymer is not contiguous over the substrate (see page 2, lines 5-8, Application as originally filed). In contrast, Galarneau et al. require that the optically curable polymer be as contiguous as possible over the substrate in order to create the single large area diffractive optic element (LADOE) with negligible distortion. Indeed, Galarneau et al. state that “each LADOE made according to the invention is characterized by having minimum seam widths between patterns of discrete diffractive optic elements that introduce negligible optical distortion to the viewer” (e.g. see Abstract) (emphasis added). The object in Galarneau et al. is to create a single larger area diffractive optical element from smaller diffractive optical elements by sequentially applying a quartz master to “tile” a pattern in

a liquid photopolymer on a substrate while minimizing the separation (gap) between the individual smaller diffractive optical elements. Further, Galarneau et al. states” [t]he seam widths were determined using the optical microscope. FIG. 4 shows the width between replicas to be approximately 7  $\mu\text{m}$  which is a significant improvement over Ni tiling where the minimum seam widths are typically 50 -70  $\mu\text{m}$ ” (col. 5, lines 65-67, col. 6lines 1-2). Clearly, Galarneau et al. teaches that ideally there should be no separation or seam width (gap) at all between the individual smaller diffractive elements when a quartz master is repeatedly applied and therefore teaches away from the instant invention which teaches having a gap. Galarneau et al. nowhere discloses, teaches or suggests the use of multiple stampers separated by a gap for making optical elements (see Claim 1: “providing a first and second stamper...said first and said second stamper being separated by a gap”). Hence, Galarneau et al. in fact teaches away from the combination suggested by the Examiner.

Hence, Claim 1 is allowable over Hamanaka et al. in view of Galarneau et al. and Claims 2, 5-6, 8 and 11 which depend from Claim 1 are allowable for at least the same reasons as Claim 1.

#### GROUNDS OF REJECTION (Claim 3)

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0,911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613), as applied to Claims 1-2, 5-6, 8 and 11, and further in view of Kondo (U. S. Patent No. 6,653,157). Claim 3 depends from Claim 1 and is allowable for at least the same reasons as Claim 1.

**GROUNDS OF REJECTION (Claims 4)**

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0, 911, 144) in view of Galarneau et al. (U.S. Patent No. 5,597,613), as applied to Claims 1-2, 5-6, 8 and 11, and further in view of Nishikawa et al. (U.S. Patent No. 6,730,459). Claim 4 depends from Claim 1 and is allowable for at least the same reasons as Claim 1.

**GROUNDS OF REJECTION (Claims 7 and 12)**

Claims 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0, 911, 144) in view of Galarneau et al. (U.S. Patent No. 5,597,613), as applied to Claims 1-2, 5-6, 8 and 11, and further in view of Morita (U.S. Patent No. 6,814,897). Claims 7 and 12 depend from Claim 1 and are allowable for at least the same reasons as Claim 1.

**GROUNDS OF REJECTION (Claims 9-10, 13-14 and 16-18)**

Claims 9-10, 13-14 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0, 911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613), and further in view of Morita (U.S. Patent No. 6,814,897), as applied to Claims 1-2, 5-7 and 11-12, and further in view of Harden et al. (U.S. Patent No. 6,610,166). Claims 9-10, 13-14 and 16-18 depend from Claim 1 and are allowable for at least the same reasons as Claim 1.

**GROUNDS OF REJECTION (Claims 14)**

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0, 911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613),

and further in view of Morita (U.S. Patent No. 6,814,897), as applied to Claims 1-2, 5-7 and 11-12 and further in view of Uehara (U.S. Patent No. 4,566,930) and Takakuwa et al. (U.S. Patent No. 6,280,660). Claim 14 depends from Claim 1 and is allowable for at least the same reasons as Claim 1.

#### GROUNDS OF REJECTION (Claims 15)

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0, 911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613), and further in view of Morita (U.S. Patent No. 6,814,897), as applied to Claims 1-2, 5-7 and 11-12 and further in view of Fujita (U.S. 2004/0090571). Claim 15 depends from Claim 1 and is allowable for at least the same reasons as Claim 1.

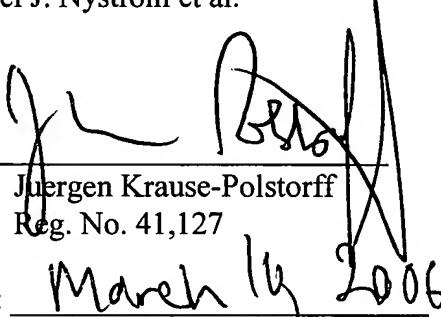
#### GROUNDS OF REJECTION (Claims 19-20)

Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamanaka et al. (EP 0, 911,144) in view of Galarneau et al. (U.S. Patent No. 5,597,613), further in view of Morita (U.S. Patent No. 6,814,897), as applied to Claims 1-2, 5-7 and 11-12 and further in view of Houlihan et al. (U.S. Patent No. 6,700,708). Claims 19-20 depend from Claim 1 and are allowable for at least the same reasons as Claim 1.

Therefore, Claims 1-20 are allowable and it is respectfully requested that the Board of Patent Appeals and Interferences reverse the Examiner's final rejection of Claims 1-20 so that this case may be allowed and pass to issue in a timely manner.

Respectfully submitted,

Michael J. Nystrom et al.

By: 

Juergen Krause-Polstorff  
Reg. No. 41,127

Dated: March 16, 2006

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## CLAIMS APPENDIX

1. A method for making molded optical elements on selected areas on a surface of a substrate comprising:

providing a first and second stamper each comprising a mold, said first and said second stamper being separated by a gap;

coating said molds with a locally dispensed optically curable polymer;

bringing said selected area on said surface of said substrate into contact with said coated molds;

exposing said surface of said substrate in contact with said coated molds to light; and

separating said substrate from said molds to leave said molded optical elements on said selected areas on said surface of said substrate.

2. The method of Claim 1 wherein said first and said second stampers are coated with a release layer.

3. The method of Claim 1 wherein said locally dispensed optically curable polymer is mechanically dispensed onto said molds.

4. The method of Claim 1 wherein said locally dispensed optically curable polymer is dispensed by bringing said molds into contact with a reservoir of optically curable polymer.

5. The method of Claim 1 further comprising placing said coated molds into a vacuum chamber for degassing.

6. The method of Claim 1 wherein said substrate is substantially transparent to light.

7. The method of Claim 1 wherein said substrate is substantially reflective to light.

8. The method of Claim 1 wherein said surface of said substrate is prepared to enhance adhesion of said optically curable polymer when said optically curable polymer is cured.

9. The method of Claim 1 wherein an alignment mark is patterned on said surface of said substrate.

10. The method of Claim 1 wherein thin metal elements are patterned on said surface of said substrate for optical functions.

11. The method of Claim 1 wherein the dimensions of said gap are determined by the separation distance between said substrate and said molds when said optically curable polymer begins to flow.

12. The method of Claim 1 wherein providing said first stamper comprises:  
coating a stamper blank with said locally dispensed optically curable polymer;  
providing a master;  
bringing said master into contact with said locally coated stamper blank;  
exposing said locally coated stamper blank in contact with said master to light;  
and

separating said master from said locally coated stamper blank to create said first stamper.

13. The method of Claim 12 wherein said master is coated with a release layer.

14. The method of Claim 12 wherein said master is made from a material chosen from the group consisting of silicon, metal, glass, and plastic.

15. The method of Claim 12 wherein said master has an alignment feature which is transferred to said first stamper.

16. The method of Claim 1 wherein providing said first stamper comprises:  
coating a stamper blank with a blanket layer of optically curable polymer;  
providing a master;  
bringing said coated stamper blank into contact with said master;  
exposing said coated stamper blank in contact with said master to light;  
separating said coated stamper blank from said master; and  
removing excess material from said coated stamper blank to create said first  
stamper.

17. The method of Claim 16 wherein said master is coated with a release layer.

18. The method of Claim 16 wherein said excess material is removed by  
chemical etch.

19. The method of Claim 1 wherein providing said first stamper comprises:  
providing a master comprising a cavity wherein optical element shapes are  
disposed;  
overfilling said cavity with said locally dispensed optically curable polymer;  
bringing a stamper blank into contact with said optically curable polymer;  
exposing said stamper blank and said optically curable polymer to light; and  
separating said master from said stamper blank leaving said optically curable  
polymer attached to said stamper blank to create said first stamper.

20. The method of Claim 19 wherein said cavity of said master is coated with a release layer.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.